

These are its characters:—Mandibles short and broad, narrowed to a thin edge and feebly toothed on the inner side, sharply incurved and pointed at the tip, with their edges superposed along nearly their whole length when closed. Antennæ scarcely reaching to half the length of the elytra. The four posterior tibiæ differ from those of the males in being simple and not dilated. The last ventral segment of the abdomen is narrowly rounded and somewhat pointed at the apex; in the male this segment is transversely truncated. The hind coxæ are rather widely separated and the intercoxal process of the abdomen is obtusely rounded in front; in the male the coxæ are closer together and the intercoxal process is sharply pointed in front.

In the Indian genus *Acanthophorus*, as represented by *A. serraticollis*, Oliv., the same kind of variation is found.

LIV.—*Natural History Notes from H.M. Indian Marine Survey Steamer 'Investigator,' Commander Alfred Carpenter, R.N., D.S.O., commanding.*—No. 13. *On the Bathybial Fishes of the Bay of Bengal and neighbouring waters, obtained during the seasons 1885-1889.* By ALFRED ALCOCK, M.B., Surgeon-Naturalist to the Survey\*.

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##### § 1. *Outline of the Hydrography of the Region.*

THE bathybial fishes hitherto collected by the 'Investigator' are all from the arm of the Indian Ocean which intervenes between the Indian and Malayan peninsulas—the sea which is generally spoken of as the Bay of Bengal. This vast stretch of water, which occupies roughly the meridians between 78° and 98° E. and the parallels between 5° and 22° N., consists of three distinct basins, namely the Bay of Bengal proper in the centre, the Gulf of Manaar to the south-west, and the Andaman Sea on the east. And it will be fitting to prelude the account of the fish-inhabitants of their

\* Communicated by the Superintendent of the Indian Museum, Calcutta.

depths with a short outline of the hydrography of the basins themselves.

*Bay of Bengal.*—The boundaries of the Bay of Bengal on the north and west are too well known to need mention; but the exact delimitation of its basin from that of the Andaman Sea has only recently been fixed with exactitude by Commander Alfred Carpenter, R.N., D.S.O., in charge of the Indian Marine Survey, to which highly scientific officer I am indebted for much more than the facts alone.

On looking at a chart of the Bay of Bengal, a chain of islands (the Preparis, Ceros, Andamans, and Nicobars) is seen to extend, with a slight western convexity, from north to south between Cape Negrais in Burmah and Acheen Head in Sumatra. And on referring to Captain Carpenter's Contour Map of the Bay (*vide* 'Administration Report of the Marine Survey of India for 1888-89') all the contour-curves are seen to converge ultimately within a hundred miles of the western coast of this chain. Quite close to the eastern shore of the chain we find, in the Andaman Sea, depths of from 1100 to 1200 fathoms, while in the channels between the islands, which connect the two seas, the depths range from 150 to 760 fathoms. This is conclusive proof of the existence of two distinct basins, separated by a comparatively narrow ridge rising into the isolated island peaks of the Andamans and Nicobars.

The Bay of Bengal thus defined touches in its extremes the meridians between  $80^{\circ}$  and  $94^{\circ}$  E. It has a maximum depth at its mouth of nearly 2400 fathoms, and its minimum temperature hitherto recorded (at 2105 fathoms) is  $33^{\circ}.7$  Fahr., corrected for pressure (Carpenter, "Mean Temperature of Deep-waters of Bay of Bengal," Journ. As. Soc. Beng. vol. lvi. pt. ii. no. 2).

In the northern part, into which the great rivers of India and the eastern ultra-Himalayan region pour their muddy waters, and almost as far south as the 1600 fathom contour, the specimens of the bottom obtained by the 'Investigator' consist of varying grey, green, blue, and brown muds, with comparatively few constituents of direct organic origin; but in the southern and more open part the 'Investigator' has almost always found *Globigerina*-ooze (*Globigerina*, *Orbulina*, and large *Pulvinulina*). Running through the shoal-water at the extreme northern end, opposite the middle of the Brahmaputro-Gangetic Delta, is the Swatch of No-ground. This, which has a direction fairly N.N.E. and S.S.W., is a narrow deep channel of over 300 fathoms in a sea of under 100 fathoms, and is reasonably regarded by Captain Carpenter as the "scour" of the rivers.

According to the researches of the same observer the southern half of the Bay is not a simple basin, for, about three and a half degrees west of the Nicobars, running almost north and south, a remarkable ridge, which may be fitly named, after its discoverer, Carpenter's Ridge, marks off on the south-east, between itself on the one side and the Nicobars and South Andamans on the other, a small basin almost symmetrical with the Gulf of Manaar on the south-west. This ridge is well seen on the contour-map (Admin. Rep. Mar. Surv. Ind. 1888-89), where the contours up to 1600 fathoms sweep across the bay in main directions of west and east or north-west and south-east, while the contours from 1700 to 2200 fathoms, within the parallels of  $16^{\circ}$  to  $6^{\circ}$  N., after taking semicircular curves, with their convexities northwards, across the western half of the bay, run down southwards in deep loops in the eastern half round the ridge, turning northwards again to their final convergence off the Nicobar-Andaman coasts. The minimum depth yet found on the ridge is 1340 fathoms.

*The Andaman Sea* is a good deal land-locked. To the south it passes into the shallow Straits of Sumatra and to the north into the far shallower Gulf of Martaban, which receives the River Irrawádi.

On the west it communicates with the Bay of Bengal by three main channels, the shallowest of which (South Preparis Channel) to the north is 150 fathoms in depth, the deepest being 760 fathoms, between the Nicobars and Sumatra. On the east it is crowded with small islands. Except in its centre and in its south-western part it is shallow. So far the greatest depths known are in the centre (1200 fathoms), close to the east coast of Middle Andaman Island (1159 fathoms, bottom-temperature  $39^{\circ}\cdot 5$  Fahr.) and near the same coast of Great Nicobar Island (1284 fathoms). The only specimens of the bottom which I have examined are from 1159 and 1130 fathoms off Middle Andaman Island, and these were dark mud, with but little matter of direct organic origin.

*The Gulf of Manaar*, between India and Ceylon, communicates with the Bay of Bengal by the shallow Palk Strait. On the south-east its basin is very abrupt. The greatest depth yet found in the more open part of the Gulf is 1466 fathoms (bottom-temperature  $34^{\circ}\cdot 8$  Fahr.), and the bottom appears to be green mud throughout. It was in this gulf that the 'Investigator' in 1886 trawled some curious barytanodules (Jones, "On some Nodular Stones obtained off Colombo in 675 fathoms," Journ. As. Soc. Beng. vol. lvi. pt. ii. no. 2, 1887).

It would be premature to indulge in any speculations concerning the bathybial fishes of the Bay of Bengal region; but the occurrence in this region of forms so long considered characteristic of the deeper waters of Madeira and the Mediterranean, many of which have also been found more lately to exist in Japanese waters and in the Pacific, must be considered highly interesting. It is interesting also, from another point of view, to find species common to this region and to the American side of the South Atlantic.

§ 2. *List of the Fishes, with Descriptions of the new Species.*

PLAGIOSTOMATA.

SELACHOIDEI.

Family Spinacidæ.

PARACENTROSCYLLIUM, gen. nov.

Allied to *Centroscyllium*.

Two dorsal fins, each with a strong spine. No anal fin. Mouth crescentic, with a direct oblique groove at each angle. Teeth equal in both jaws, minute, simple, monocuspid, straight. No membrana nictitans. Gill-openings rather wide. Integument smooth.

*Paracentroscyllium ornatum*, sp. n.

All the tissues fragile. Head broad and depressed, the branchial region conspicuously prominent. Body subcylindrical. Tail long. Snout short, broad, depressed. Eyes large, their major diameter being one third of the head-length (branchial region included). Nostrils a little wider than the spiracles, borne at and on the under surface of the edge of the snout. Mouth crescentic and rather wide. Minute, simple, straight, monocuspid teeth in both jaws. Integument absolutely smooth. Dorsal spines very strong, the second much the larger. The first dorsal fin begins an interval behind the pectorals equal to the interval of the second behind the ventrals. Pectorals, ventrals, and caudal all large.

Colours "deep violet black, lighter between the eyes; head with minute white spots arranged in the shape of a lute; ventrals with pale tips" (*Dr. G. M. Giles*).

Length  $5\frac{1}{4}$  inches.

Two males and one female, in bad preservation.

*Hab.* Bay of Bengal, Swatch of No-ground, 405 to 285 fathoms; bottom Pteropod-ooze and green mud.

## BATOIDEI.

## Family Rajidæ.

## RAJA, Cuv.

*Raja mamillidens*, sp. n.

All the tissues fragile. Snout short. Disk, including the ventrals, half the total length, its breadth the same; in shape subquadrangular, with rounded pectoral angles and snout; the whole of its upper surface, including eye-covers and fins, densely covered with acuminate granules. The tail similarly covered, on its upper surface and sides in the anterior half, everywhere, including the dorsal and rudimentary caudal fins, in its posterior half. Large recurved spines, one above each angle of each orbit, one inside each inner spiracular angle, one or two on each shoulder-girdle, and thirty in a row down the middle dorsal line as far as the first dorsal fin. Under surface of disk, ventrals, and anterior half of tail perfectly smooth. Width of the interorbital space equal to the length of the orbit and nearly twice the major diameter of the spiracle. Interval between the outer edges of the nostrils greater than the interval between the nostrils and the tip of the snout. Mouth crescentic. Teeth in a pavement, showing twenty-four oblique rows in the upper and eighteen in the lower jaw; each tooth with a broad globular base and a gently pointed mamillary summit. Dorsal fins adjacent but separate.

Colour "uniform jet-black throughout" (*Prof. Wood-Mason*).

One female specimen,  $11\frac{1}{2}$  inches long.

*Hab.* Gulf of Manaar, lat.  $6^{\circ} 29' N.$ , long.  $79^{\circ} 34' E.$ , 597 fathoms.

## ACANTHOPTERYGII.

## Family Berycidæ.

## TRACHICHTHYS, Shaw.

*Trachichthys intermedius*, Hector.

*Trachichthys intermedius*, Hector, Tr. New-Zealand Inst. vol. vii. p. 245, pl. xi. fig. 18 a; Günther, Zool. 'Challenger' Exp. vol. xxii. p. 24, pl. v. fig. D.

One specimen, from the Bay of Bengal, lat.  $19^{\circ} 35' N.$ , long.  $92^{\circ} 24' E.$ , 272 fathoms; bottom-temperature  $50^{\circ}$  Fahr.

## POLYMIXIA, Lowe.

*Polymixia nobilis*, Lowe.

*Polymixia nobilis*, Lowe, Cambr. Phil. Trans. 1833, vol. vi. p. 198;  
Günther, Fishes, vol. i. p. 17.

*Nemobrama Webbii*, Valenciennes, in Webb & Berthel. Ichthyol. Iles Canar.  
p. 41, pl. viii.

*Polymixia Loweii*, Günther, Fishes, vol. i. p. 17; \*Poey, Rep. Cub. ii.  
p. 158.

\**Dinemus venustus*, Poey, Mem. Cub. 1860, pp. 161, 352, pl. xiv. fig. 1.

*Polymixia japonica*, Günther, Ann. & Mag. Nat. Hist. 1877, vol. xx.  
p. 436; Steindachner, Denk. Ak. Wien, 1883, xlvii. p. 261, tab. iv.  
fig. 2.

*Polymixia nobilis*, Günther, Zool. Chall. Exp. xxii. 34, pl. i. fig. B.

One specimen, from the Andaman Sea, off Ross Island  
(Middle Andaman), 271 fathoms.

## Family Trachinidæ.

## CHAMPSODON, Günther.

*Champsodon vorax*, Gthr.

*Champsodon vorax*, Günther, P. Z. S. 1867, p. 102; Zool. Chall. Exp.  
vol. i. pt. vi. pp. 43, 52, 56, pl. xxiii. fig. A, vol. xxii. p. 49; Alcock,  
Journ. As. Soc. Beng. vol. lviii. pt. ii. no. iv. 1889.

Several specimens from the Bay of Bengal, 40 miles south-  
west of Akyab, 100 fathoms.

## Family Pediculati.

## CHAUNAX, Lowe.

*Chaunax pictus*, Lowe.

*Chaunax pictus*, Lowe, Trans. Z. S. vol. iii. p. 339, pl. li.; Günther,  
Fishes, vol. iii. p. 200; Goode, Proc. U. S. Nat. Mus. vol. iii. 1881,  
p. 470.

\**Chaunax fimbriatus*, Hilgendorf, Sitz. Gesellsch. naturf. Freunde,  
1879, p. 80; Steindachner & Döderlein, Denkschr. Ak. Wien, xlix.  
1884, p. 194.

*Chaunax pictus*, Günther, Zool. Chall. Exp. xxii. p. 53, pl. x. fig. A.

Several specimens, from the Bay of Bengal, lat. 20° 17' 30"  
N., long. 88° 51' E., 272 fathoms.

\* These references I give on the authority of Dr. Günther, to whose  
great work I am entirely indebted.

## HALIEUTÆA, C. &amp; V.

*Halieutæa coccinea*, sp. nov.

D. 5. A. 4. C. 9. P. 14. V. 1/5.

Discriminated at once from *Halieutæa stellata* by the less depressed head, the fine needle-pointed spines, which also extend over the under surface, and the bilobed supraoral tentacle. Head much as in *H. stellata*, but with its surface more convex from side to side and rising more from behind forwards, so that anteriorly it forms a wide dome. Disk and body uniformly covered above and below with spines having stelliform bases and simple, tapering, acute points, except round the edge of the disk, where they are trident; those on the under surface are small. Skinny filaments round the disk and mouth few and inconspicuous. Supraoral tentacle with two fleshy lobes. Eyes large, their major diameter one ninth the disk-length. Interorbital space widest behind, where it is equal to two eye-lengths, slightly concave in front, flat behind; its surface covered with small stelliform spines. No prominent supraorbital edge. Nostrils situated as in *H. stellata*, but proportionately larger. Mouth as in *H. stellata* and with similar teeth; its cleft nearly half as broad as the disk, its floor up to the root of the tongue coloured (sepia-brown in spirit).

Other external characters as in *H. stellata*.

Colours:—"Dorsum bright pink, with fine black vermicular lines; under surface dark crimson" (*Prof. Wood-Mason*). In spirit quite white, with the dark vermicular lines showing.

Branchial and peritoneal cavities lined with a thick, jet-black, velvety membrane. Intestine long and coiled. No pyloric cæca.

One specimen,  $7\frac{1}{2}$  inches long.

*Hab.* Andaman Sea, 7 miles south-east by south of Ross Island (Middle Andaman group), in 265 fathoms.

One more Acanthopterygian remains to be described—an apparently mature bathybial fish, which does not wholly conform to the diagnosis of any described family of the suborder. In the majority of its characters it agrees with the Trachinidæ, differing, however, from the members of that family in the entire absence of teeth. It appears, in short, to be a toothless Trachinid. I describe it, leaving its exact determination to more experienced ichthyologists.

## BREPHOSTOMA, gen. nov.

Soft tissues, except the dermal productions, rather delicate. Head large, quite unarmed. Body low, rather elongate, with large ctenoid scales. Mouth small, oblique, weak. Teeth entirely absent. Eyes large, lateral. Two dorsal fins, the spinous the less developed; anal similar to the soft dorsal; ventrals thoracic, with one spine and five rays. Gill-opening very wide; seven branchiostegals; pseudobranchiæ. No anal papilla. No air-bladder. Long pyloric cæca, in moderate number.

*Brephostoma Carpenteri*, sp. nov.

B. 7. D.  $5/\frac{1}{10}$ . A.  $\frac{1}{5}$ . L. lat. 30. L. tr. 12.

Soft tissues, except the dermal productions, rather delicate. Body low, rather elongate and compressed, gently diminishing from the shoulder to the base of the caudal. Head pyramidal, entirely unarmed; cranial bones, but not the other head-bones, firm. Snout short, broad, depressed, wedge-like, barely two thirds of the diameter of the eye in length. Eyes lateral, large, circular, their diameter more than one third the length of the head. Supraorbital margin in the dorsal profile. Pre-orbital a broad triangular plate, almost overlapping the closed mouth.

Infraorbitals apparently not articulating with the preoperculum. Nostrils small. Mouth lateral, small, its cleft oblique, barely reaching to the level of the anterior border of the orbit. Jaws weak, edentulous, but with semicartilaginous cutting-edges, that of the lower jaw the more prominent and ending just inside the angle of the mouth in an oval plate. The lower jaw closes inside the upper, except anteriorly, where it projects slightly; its rami are so broad that their lower edges are in contact with each other through the greater part of their extent. Vomer and palatines edentulous. Tongue free, smooth. Floor of the mouth black. No barbels. Gill-cover complete, its constituent bones almost membranous and quite unarmed; the preoperculum with a double edge. Seven branchiostegals. Gill-openings very wide, the gill-membranes entirely separate. Four gills, with well-developed laminae. Four gill-clefts. Large pseudobranchiæ. Gill-rakers of the outside of the first arch numerous, close-set, and long, elsewhere very short. Gill-chamber black.

The entire head and body covered with strong, thick, oblong, adherent, imbricating, ctenoid plates, those on the body from  $\frac{3}{16}$  to  $\frac{1}{4}$  inch in their major diameter, those on the opercles and

cheeks a little larger. There are thirty rows between the gill-opening and the caudal base and twelve between the first dorsal fin and the median abdominal line. The lateral line follows the dorsal profile, at two rows of scales distance, uninterruptedly from the shoulder to the caudal base. Two normally situated dorsal fins, separated by a snout-length, the second much the higher; the first has five stout sharp spines, the three anterior a little longer than the snout; the second has one short spine and ten branched rays, and is invested at its base with scales. Anal with one spine and nine branched rays, situated opposite the second dorsal, and similar to it in every respect. Caudal short, forked; its proximal half scaly. Pectorals well developed, as long as the head without the snout. Ventrals thoracic, with one spine and five rays with scaly bases.

Colour:—Head, body, fins, and iris uniform black.

No air-bladder. Long pyloric cæca in moderate number. No prominent anal papilla.

One specimen, measuring 4 inches from the tip of the snout to the base of the caudal.

*Hab.* Bay of Bengal, summit of Carpenter's Ridge, lat. 6° 18' to 16' N., long. 90° 40' to 44' E., 1370 to 1520 fathoms.

The probability that this fish came actually from the bottom is increased by the fact that it was imbedded in the head of one of the swabs. Such a position, in the case of an active animal like a fish, would result from the swab settling over the fish as it lay on the bottom, and can hardly be accounted for otherwise.

#### ANACANTHINI.

The Indian deep-sea representatives of this suborder hitherto obtained are remarkable for their small size. The largest Ophidiid measures 11½ inches and the largest Macrurid 11 inches, while most of our specimens of both these families are much smaller. That this is not due to immaturity is proved by the fact that a majority of the specimens are females with enlarged ovaries full of apparently ripe ova.

#### Family Ophidiidæ.

#### SIREMBO, Bleeker.

#### *Sirembo nigripinnis*, sp. nov.

B. 8. D. circ. 95. A. circ. 85. C. ? P. 28. V. 1.

Head small, scaly, a good deal lower than the body, which

is compressed, elongate, and tapering, with a maximum height nearly equal to the length of the head. Snout as long as the eye, or  $4\frac{3}{4}$  in the head-length, rounded, scaly. Interorbital space wider than the eye, and, like the crown of the head, flattened. Operculum with one spine above. Preoperculum excised at its angle. Nostrils of moderate size, the anterior near the end of the snout. Mouth wide, the maxilla reaching behind the posterior border of the orbit. No barbel. Villiform teeth in bands in the jaws, palatines, and vomer. Tongue small. Gill-cleft wide; four gills, with narrow laminae. Pseudobranchiæ thick and fleshy. Gill-rakers numerous and almost as long as the eye on the first arch; elsewhere almost tuberculate. Scales small, smooth, deciduous. Lateral line running about nine rows of scales below the dorsal fin. Vertical fins united with the caudal; the dorsal begins in the vertical to the base of the pectoral, the anal a head-length behind the same level. Pectorals fine, pointed, not quite as long as the postorbital portion of the head. Ventrals simple filaments arising at the symphysis of the pectoral arch; in length equal to the postorbital portion of the head.

Colours in spirit uniform sepia-brown, with black fins.

Stomach siphonal: one rudimentary and nine medium-sized cæca in a ring round the pylorus. Air-bladder present.

A single rather mutilated specimen  $6\frac{1}{2}$  inches long.

*Hab.* Andaman Sea,  $7\frac{1}{2}$  miles east of North Cinque Island, 490 fathoms.

#### NEOBYTHITES, Goode and Bean.

##### *Neobythites macrops*, Gthr.

*Neobythites macrops*, Günther, Zool. Chall. Exp. vol. xxii. p. 102, pl. xx. fig. A.

Several specimens from the Andaman Sea, off Ross Island, in 265 to 271 fathoms.

#### DIPLACANTHOPOMA, Gthr.

##### *Diplacanthopoma brachysoma*, Gthr.

*Diplacanthopoma brachysoma*, Günther, Zool. Chall. Exp. vol. xxii. p. 115, pl. xxiii. fig. C.

A female  $4\frac{1}{4}$  inches long, with gravid ovaries.

*Hab.* Andaman Sea,  $7\frac{1}{2}$  miles east of North Cinque Island, 490 fathoms.

## PYCNOCRASPEDUM, gen. nov.

Allied to *Barathrodemus*.

Head large, body compressed, both covered entirely with small, thin, smooth, rather deciduous scales. Head-bones and opercles spineless. Snout short, broad, and not overhanging the jaws, which are equal in front. Eye of moderate size. Mouth very large; teeth in villiform bands in the jaws, palatines, and vomer. No barbel. Gill-openings wide, gill-membranes entirely separate; four gills; eight branchiostegals; no pseudobranchiæ. Lateral line incomplete on the tail. Vertical fins invested with thick scaly skin. Caudal free, united with the verticals at its extreme base only. Pectoral fins entire. Ventral fins in the form of bifid filaments.

*Pycnocraspedum squamipinne*, sp. nov.

Head large, flattened a little laterally and very much at its crown; body broad immediately behind the head, where its height is  $5\frac{1}{4}$  in the total length; its posterior portion and the tapering tail compressed. Head in length  $3\frac{2}{3}$  in the total (with caudal); its height  $1\frac{5}{7}$  in its length; its width a little over  $\frac{2}{3}$  its height; all its bones strong and smooth. Snout broad, rounded, rather depressed, flattened at the tip, and not overhanging the jaws; its length is hardly more than that of the eye, which is one sixth of that of the head. Interorbital space flat and wider than the long diameter of the eye. Operculum with a bony ridge above, ending in a blunt point. Preoperculum slightly emarginate at its angle. A large open nostril in front of the eye and a smaller valved one near the edge of the snout. Cleft of mouth obliquely ascending, its gape enormous. The maxilla, which extends behind the vertical from the posterior border of the orbit, is much expanded posteriorly, and there covered with scales. The premaxillaries are protractile and not closely approximated. All the jaw-bones very strong. Teeth in villiform bands in the jaws and palatines and in a V-shaped patch on the vomer.

Gill-openings very wide; gill-laminæ rather broad; four long gill-rakers on the outer edge of the middle of the first arch, elsewhere in the form of short knobbed styles. Body and head covered with small, thin, smooth, rather deciduous scales, fifty-two in a transverse line through the anus. The lateral line ends in the posterior fourth of the tail. Vertical fins with stout rays invested with thick integument and covered with scales smaller than those on the body; the dorsal begins just in front of the base of the pectorals. Caudal ex-

panded posteriorly, with a vertically straight edge, its base united with the vertical fins. The pectorals, which have fleshy free bases, are as long as the postorbital portion of the head and are scaly through their basal third. The ventrals are bifid filaments, inserted at the symphysis of the pectoral arch.

Colours in life :—" Head slate-coloured ; body uniform dirty green-chocolate, the vertebral line showing through as a lake-coloured stripe" (*Dr. G. M. Giles*). Vertical fins black in spirit.

Abdominal cavity large, parietal peritoneum black ; stomach siphonal, with a bulbous pyloric portion ; the first part of the intestine passes straight forward, and has on each side, in a row, six large long cæca, and at the pylorus a single median one ; it then turns abruptly back, and is thrown into a wide coil held by stout mesentery, beyond which it is straight. Air-bladder large and saccular.

Three specimens, the longest being  $11\frac{1}{2}$  inches.

*Hab.* Bay of Bengal, lat.  $20^{\circ} 17' 30''$  N., long.  $88^{\circ} 50'$  E., 193 fathoms ; temperature at bottom  $52^{\circ}$  Fahr.

#### PARADICROLENE, gen. nov.

Allied to *Dicrolene* and *Pteroidonus*.

The lower pectoral rays detached from the upper part of the fin, free, and prolonged. Body elongate and compressed ; it and the head covered with small thin scales. Snout short, broad, and not overhanging the jaws. Eye moderate. No supraorbital spines. Mouth wide ; teeth in villiform bands in the jaws, palatines, and vomer. No barbel. Operculum and preoperculum armed. Gill-openings wide ; gill-membranes entirely separate ; four gills ; eight branchiostegals ; no pseudobranchiæ. Lateral line incomplete on the tail. Vertical fins invested by the integument, but not scaly. Caudal free, joined at its base only to the vertical fins. Ventral fins in the form of bifid filaments.

#### *Paradicrolene multifilis*, sp. nov.

B. 8. D. circ. 100. A. circ. 85. C. 4. P. 18/8-10.

V. 2. L. tr. 34 above vent.

Head conoid, body elongate and compressed, tail finely tapering. Height of the body a little over one sixth of the total length (with caudal). Length of head about  $4\frac{1}{2}$  in the total (with caudal) ; its height nearly two thirds its length,

its width four fifths of its height; all the bones strong. Snout as long as the eye, which is nearly one fifth of the length of the head, broad, rounded, and not overhanging the jaws. Supraorbital margin sharp; interorbital flat from side to side, in width equal to three half-diameters of the eye. Operculum with a strong horizontal bony stay, ending in a long spine, and with an obliquely vertical stay not ending in a distinct spine. Preoperculum with three radiating flat spines at its angle. Nostrils large and open, their longer diameter, which in the anterior is nearly horizontal, in the posterior nearly vertical, is equal to half the diameter of the eye. Cleft of mouth oblique, its gape wide. The dilated scaly extremity of the maxilla reaches half a diameter of the eye behind the posterior border of the orbit. The lower jaw is included within the upper and has a large open pore on each side behind the symphysis. Narrow bands of villiform teeth in the jaws and palatines and in a V-shaped patch on the vomer. About eleven gill-rakers nearly three fourths the length of the eye along the outer edge of the first arch; elsewhere they are short and truncated. Head and body covered with small, thin, smooth scales. The lateral line runs six rows of scales below the dorsal fin and ends in the last third of the tail. The vertical fins are invested by the integument, but are not scaly; the dorsal is the higher, and begins behind the vertical through the root of the pectoral, the distance of the origin of the anal from the same point being equal to the length of the head without the snout. The caudal is nearly half as long as the head and very narrow; its base only is adherent to the vertical fins.

The pectoral, which has a broad fleshy base, is slightly longer than the head without the snout; its eight to ten lower rays are stronger than the others, detached, and free throughout, decreasing in length from above downwards, the longest being one third longer than the fin. The ventrals are bifid filaments, arising in advance of the vertical from the posterior edge of the operculum, and one third the length of the head.

Colours in life:—"Head slate-coloured, body uniform dirty green-chocolate, the vertebral line showing through lake-coloured" (*Dr. G. M. Giles*).

Parietal peritoneum black; stomach siphonal, with a bulbous pyloric portion; a few rudimentary villiform pyloric cæca. Air-bladder moderate. Many of the specimens with gravid ovaries and apparently mature ova.

Average length  $6\frac{1}{2}$  inches.

*Hab.* Bay of Bengal, lat.  $20^{\circ} 17' 30''$  N., long.  $88^{\circ} 50'$  E., 193 fathoms; temperature  $52^{\circ}$  Fahr.

A single specimen,  $7\frac{1}{4}$  inches long, from the Andaman Sea, east of Port Blair, 271 fathoms, has the abdominal region equal to the length of the head and the ventral filaments half as long as the head.

SACCOGASTER, gen. nov.

Allied to *Catalax*.

Body compressed, little elongate, partly invested by minute, membranous, non-imbricating scales. Abdomen large. Head with loose scaleless skin. Snout a little inflated, not projecting beyond the equal jaws. Bones of the head firm, without spines, the mucous channels well developed but without conspicuous external openings. Opercles unarmed. No barbels. Eyes small. Mouth wide. Bands of villiform teeth in jaws, palatines, and vomer, and an inner row of enlarged teeth in the mandible. Vertical fins confluent with the caudal. Ventrals simple filaments. Four gills; eight branchiostegals; no pseudobranchiæ. No pyloric cæca.

*Saccogaster maculatus*, sp. nov.

B. 8. D. circ. 82. A. circ. 55. P. 18. V. 1. C. 12?

Head with aspect of *Collichthys*; body deep, with an inflated abdomen abruptly constricted at its junction with the low, compressed, tapering tail. Length of head  $3\frac{3}{8}$  in the total, three fourths as broad as high, abruptly convex behind the broad depressed interorbital region, covered with a loose scaleless skin. Snout half as long again as the diminutive eye, broad, depressed, inflated laterally, but not overhanging the jaws. Operculum with a bony stay, not ending in a distinct spine above. Preopercular border full, sloping backwards, rounded and smooth. Preorbital broad. The eyes, which are deep-set and covered with loose tough skin, are placed far forward, and by the flattening of the fore part of the head occupy an almost superior position, but with a lateral visual axis; their long diameter is rather less than one ninth the length of the head and less than their distance apart. Nostrils inconspicuous. Cleft of mouth wide and oblique; the maxilla is half as long as the head, and has a much dilated posterior extremity; rami of the lower jaw broad, with sharp lower edge. Villiform teeth in the jaws, palatines, and vomer, and an inner close-set row of uniformly enlarged teeth in the mandible. Tongue large, thick, and fleshy. Gill-openings very wide, the membranes united at their extreme anterior limit; gill-laminæ narrow; gill-rakers almost tuber-

culate. A broad bridge of loose skin connects the gill-cover with the base of the pectoral fin. Integument loose, thin but tough, covered along the flanks of the body only with minute, membranous, irregular, non-imbricating scales. Lateral line, if present, only on the anterior part of the trunk. Vertical fins confluent with the caudal, which is pointed and half as long as the head; the dorsal begins behind the vertical through the base of the pectoral, the anal a head-length and a quarter behind the same level. Pectoral with a thick, fleshy, free base, constituting one third the entire extent of the fin. Ventrals simple filaments arising in the vertical from the posterior border of the preoperculum.

Colours in life:—"Head dark chocolate; body light chocolate, with minute white spots along its sides" (*Dr. Giles*).

Abdominal cavity large; stomach siphonal; no pyloric cæca. An air-bladder.

Two specimens, both females with gravid ovaries, one 3½ inches, the other 4 inches long.

*Hab.* Bay of Bengal, lat. 20° 17' 30" N., long. 88° 50' E., 193 fathoms.

#### GLYPTOPHIDIUM, gen. nov.

Allied to *Bathyonus*.

Head large, body compressed, with a long tapering tail. Scales deciduous and very thin. Bones of head soft and cavernous, with prominent outstanding crests. Operculum small, with one feeble spine. Snout obtuse. Jaws equal in front. Mouth wide. Villiform teeth in narrow bands in the jaws, palatines, and vomer. No barbel. Eyes large. Caudal free. Ventrals simple filaments. Gills four, with short laminae. Branchiostegals eight. Pseudobranchiæ. Pyloric appendages small.

#### *Glyptophidium argenteum*, sp. nov.

B. 8. D. 98. A. 75. C. circ. 15. P. 23. V. 1.

Head and body compressed, tail long and tapering, with a long, narrow, free caudal. Length of head nearly 4½, maximum body-height 5½ in the total (caudal included). In spirit nine frill-like, membranous, longitudinal crests stand out on the head, namely an interrupted median one from snout to occiput, and on each side a supraorbital, a temporal, an infraorbital, and a submandibular. Snout as long as the eye, or 4½ in the head, broad, rounded, and not overlapping the equal

jaws. Interorbital space wider than the eye. Operculum very small, with a feeble flat spine above; preoperculum expanded, with a rounded margin. Teeth in narrow bands on the jaws, palatines, and hyoid, and in a V-shaped patch on the vomer. Mouth large, its cleft oblique. Jaws slender. Gill-opening wide; gill-laminæ very narrow; gill-rakers numerous and elongate on the outer side of the first branchial arch, elsewhere very short. Scales deciduous and extremely thin. Lateral line undistinguishable. The dorsal fin begins in front of the vertical through the base of the pectoral, with the anal at a distance behind equal to the length of the head behind the middle of the orbit. Caudal nearly half as long as the head, united with the vertical fins at its base only. Pectorals pointed, as long as the head without the snout. Ventrals arising at the pectoral symphysis.

Colours in spirit:—Head and body silvery, with minute black specks; fins silvery grey.

A siphonal stomach, with a bulbous pyloric portion; it and the long coiled intestine invested in black peritoneum; six small pyloric cæca in a ring round the pylorus. An air-bladder.

One specimen, rather mutilated,  $7\frac{3}{4}$  inches long.

*Hab.* Andaman Sea, off Ross Island, in 271 fathoms.

### Family Macruridæ.

#### MACRURUS, Bloch.

##### Subgenus CÆLORIYNCHUS (Giorna).

##### *Macrurus parallelus*, Gthr.

*Macrurus parallelus*, Günther, Ann. & Mag. Nat. Hist. 1877, vol. xx. p. 439; Zool. Chall. Exp. vol. xxii. p. 125, pl. xxix. fig. A.

Two young specimens, in bad preservation, believed to be this species.

*Hab.* Gulf of Manaar, lat.  $6^{\circ} 29'$  N., long.  $79^{\circ} 34'$  E., 597 fathoms.

##### Subgenus MACRURUS (Bloch).

##### *Macrurus investigatoris*, sp. nov.

B. 7. D. 12. A. circ. 100. P. 21. V. 9.

The whole of the head except the maxilla, the upper part of the mandible, and the glosso-hyal region densely scaly.

Snout not quite so long as the eye, with a median and two lateral, rough, marginal knobs; overhanging the mouth.

Diameter of the eye  $3\frac{3}{4}$  in the head-length, and exceeding the width of the flat interorbital space. Nostrils, especially the posterior, very large, joined by a broad loop of skin which gives the anterior a subtubular appearance. Mouth inferior, small, its cleft hardly passing behind the level of the anterior border of the orbit. Barbel barely half as long as the eye. Teeth in villiform bands in the jaws, only the outer row in the premaxillæ enlarged. Gill-membranes rather broadly united. Scales uniform, moderate-sized on the body, smaller on the head, very small on the snout. A scale from the abdomen has nine parallel longitudinal rows of long accumbent spinelets, the last in each row projecting beyond the edge of the scale; there are about eight spinelets in the middle row, and two in the outermost. To the naked eye, and even with the hand-lens, these rows of spinelets appear like unbroken keels. The scales along the edge of the snout and the supra-orbital ridge are thorny. The lateral line runs six rows of scales distant from the base of the first dorsal fin. Second dorsal spine somewhat prolonged, its front edge with about eighteen equal semirecumbent barbs. The second dorsal fin arises less than a head-length behind the first; its anterior rays inconspicuous. Pectoral pointed, as long as the head behind the middle of the eye. Ventrals with the outer ray produced into a filament longer than the fin itself.

Colours in life:—"Body dull grey; abdomen slate-coloured; sides of head and lower jaw silvery; operculum violet-black; first dorsal black, with white root and tip" (*Dr. G. M. Giles*).

A cluster of about twelve long filiform appendages round the pylorus. A large thin-walled air-bladder.

Several specimens with gravid ovaries.

Greatest length 8 inches.

*Hab.* Andaman Sea, all along the Andaman chain, in 265 to 490 fathoms; Bay of Bengal, from 193 to 405 fathoms.

The commonest apparently of the Indian Macrurids.

Many specimens carry parasitic Copepods.

*Macrurus semiquincunciatus*, sp. nov.

B. 7. D. 12. P. 21. V. 11. (A. ?)

Head squarish. Snout barely longer than the eye and not greatly overhanging the mouth; a single median marginal tubercle. Diameter of the eye rather over one fourth the

length of the head and exceeding the width of the flattened interorbital space. Nostrils very large, the anterior separated from the posterior by a broad loop of skin. Cleft of mouth hardly extending behind the anterior border of the orbit. Barbel as long as the eye. A broad band of villiform teeth in each jaw and in the upper an outer row of considerably enlarged teeth. Gill-laminae broad. Head and body covered with spinigerous imbricating scales, those on the body of a uniform moderate size, with about fifteen longitudinal parallel rows of spinelets, the last in each row projecting far beyond the edge of the scale; and towards the distal end of each interspace between these rows is a short series of similar spinelets only slightly projecting beyond the edge of the scale. Eight series of scales between the first dorsal fin and the lateral line. Dorsal fins separated by an interval equal to the length of the base of the first. Second dorsal spine as long as the head, with fifteen equal semirecumbent barbs along its front edge. Outer ventral ray produced into a long filament.

Colours in spirit:—Sepia-brown; first dorsal, pectoral, and ventral fins black, anal edged with black.

Twenty-two long vermiform pyloric caeca. A large air-bladder.

One specimen, 8 inches long, the tail a healed "stump."

*Hab.* Bay of Bengal, south by west of North Sentinel Island (Andamans), in 130 to 250 fathoms.

*Macrurus brevirostris*, sp. nov.

B. 6. D. 12. P. 19. V. 10.

Snout conspicuously short, with a prominent median marginal tubercle. The horizontal diameter of the eye is nearly one third the length of the head, nearly twice the length of the snout without the nasal tubercle, and much in excess of the width of the interorbital space. Mouth inferior, its cleft just reaching the level of the anterior border of the orbit. Barbel slender, not so long as the eye. Teeth in a broad villiform band in each jaw, and in the upper two outer rows of enlarged teeth, those in the outermost row regular and much enlarged, those in the more internal row irregular and less enlarged. Gill-membranes broadly united. Scales small on the head, uniformly large on the body. A scale from the abdomen has more than twenty approximated rows of close-set conical spinelets, of which five arrangements can be easily distinguished, according to the point from which the scale is

viewed, namely : in oblique rows from above and before downwards and backwards, or from below and before upwards and backwards ; in less oblique rows converging from above and below to an incomplete horizontal median row ; in regular equidistant concentric curves, of which the outer are interrupted at the edge of the scale, round a central horizontal row ; and in a deep, close-set, diminishing series of quincunxes. There are seven and a half rows of scales between the base of the first dorsal fin and the lateral line. The interval between the dorsal fins is equal to the length of the postorbital portion of the head. The second dorsal spine, which is prolonged into a short filament, is longer than the head and edged in front with twenty-two semirecumbent barbs. The outer ventral ray is produced into a filament nearly as long as the fin.

Colours in spirit:—Grey ; abdomen, throat, and paired fins black.

About thirty-five very large, long, pyloric cæca. Liver large, its right lobe occupying the whole of that side of the abdominal cavity. An air-bladder.

One specimen, 11 inches long.

*Hab.* Andaman Sea,  $7\frac{1}{2}$  miles east of North Cinque Island, in 490 fathoms.

*Macrurus macrolophus*, sp. nov.

B. 6. D. 11. A. 66. P. 21. V. 8.

Head conspicuously long,  $3\frac{4}{5}$  in the total. Snout rounded, with a small low nasal tubercle, overhanging the mouth, hardly longer than the eye. Eye large, its diameter  $4\frac{1}{4}$  in the head-length and considerably exceeding the width of the bilaterally-flattened interorbital space. Nostrils moderate-sized. Mouth inferior, its cleft not reaching the vertical from the anterior border of the orbit. Barbel less than half the length of the eye. A broad band of villiform teeth in each jaw, and in the upper an outer row of slightly enlarged teeth. Gill-openings rather narrow ; the gill-membranes not directly united, but attached on each side to the broad isthmus ; gill-laminæ rather broad. Head and body covered with scales, those on the body uniformly large. A scale from the abdomen has about seventeen series of semierect conical spinelets, arranged similarly to those of *M. brevirostris*. There are five rows of scales between the base of the first dorsal fin and the lateral line. The dorsal fins are separated by an interval equal to the length of the postorbital portion of the head.

The second dorsal spine is produced into a long filament and is nearly twice the length of the elongated head, or about half the total length of the fish; the basal portion has twenty close-set semirecumbent barbs and the filament several distant more upright spinelets. The outer ventral ray produced into a filament not quite so long as the fin.

Colours in spirit:—Grey; first dorsal, pectorals, and ventrals black, the dorsal filament white.

Ten large, long, pyloric cæca; intestine much coiled. An air-bladder.

One specimen, a female,  $9\frac{1}{2}$  inches long, with gravid ovaries.

*Hab.* Andaman Sea, south-east by south of Ross Island, in 265 fathoms.

*Macrurus lophotes*, sp. nov.

B. 6. D. 13. V. 9.

Head rather square. Snout with a very prominent nasal tubercle, a little longer than the eye, which is  $4\frac{1}{2}$  in the head-length and wider than the interorbital space. Mouth inferior, its cleft reaching the vertical from the middle of the orbit. Barbel very small. Teeth in broadish villiform bands in both jaws, the upper jaw with a slightly enlarged outer row. Scales very small, with five short, longitudinal, parallel series of long, rather recumbent spinelets, the distal ones projecting far beyond the edge of the scale. Six rows of scales between the first dorsal fin and the lateral line. The second dorsal spine, which is produced into a long filament, is nearly twice as long as the head and armed along its entire extent with thirty semirecumbent barbs. Ventrals with the outer ray produced into a filament.

Colours in spirit:—Pinkish grey; opercles black.

Two specimens, 5 inches long, in fragments.

*Hab.* Bay of Bengal, the "Swatch," in 285 to 405 fathoms.

The specimens are far too much spoilt for complete description.

*Macrurus polylepis*, sp. nov.

B. 7. D. 11 (12). A. circ. 140. P. 19. V. 10.

Head deep, compressed, rather square, rising steeply from behind the orbits to the first dorsal fin, much higher than the low tapering body. Tail extremely long, filiform. Snout shorter than the large eye, with a prominent spiny nasal tubercle, flanked on each side by a rough marginal knob.

Diameter of the eye  $3\frac{1}{2}$  in the head-length, much exceeding the width of the flattened interorbital space. Nostrils large, contiguous. Mouth inferior; the maxilla reaches the vertical from the middle of the orbit. Villiform teeth in the jaws, the outer row in the upper jaw enlarged. Barbel about as long as the eye. Opercular region square, very deep and broad. Gill-openings wide, the membranes united only in front. Gill-laminæ very broad. Scales rather deciduous and uniformly minute, each with about seven short, longitudinal, parallel series of spinelets, the last in each series projecting well beyond the edge of the scale. Eight rows of scales between the first dorsal fin and the lateral line. Second dorsal separated from the first by an interval equal to the length of the latter's base. Second dorsal spine with large semirecumbent distant barbs. First ventral ray produced into a filament longer than the fin.

Colours in life:—"Body dull grey; abdomen slate-coloured; sides of head and lower jaw silvery; operculum violet-black; dorsal fin black, with white root and tip" (*Dr. G. M. Giles*).

Two specimens,  $5\frac{1}{4}$  and  $6\frac{1}{2}$  inches long respectively, both much damaged.

*Hab.* Bay of Bengal, lat.  $20^{\circ} 17' 30''$  N., long.  $88^{\circ} 51'$  E., in 193 fathoms, and lat.  $19^{\circ} 35'$  N., long.  $92^{\circ} 24'$  E., in 272 fathoms.

### Subgenus MYSTACONURUS, Gthr.

#### *Macrurus heterolepis*, sp. nov.

B. 6. D. 11. A. circ. 100. P. 14. V. 10.

Head much exceeding the trunk in all three dimensions, its mucous-cavities and its bony ridges, except the infra-orbital, well developed. The short trunk falls abruptly to the long filiform tail. Snout truncated, much shorter than the eye, hardly overlapping the upper jaw. Diameter of the eye  $3\frac{3}{4}$  in the head-length and less than the width of the inter-orbital space. Mouth wide, hardly inferior, its cleft reaching the vertical from the middle of the orbit. Jaws slender. A ciliiform barbel about half as long as the eye. Teeth in both jaws in a narrow villiform band. Gill-cleft wide; the membranes united only quite anteriorly. Gill-laminæ very narrow. Integument thin. Head scaleless. Body covered with very thin and deciduous scales of two forms, those immediately behind the head being large and perfectly smooth, those on

the rest of the body being small and covered with semierect spinelets arranged quincuncially—six deep in the middle line of the scale. Seven rows of scales between the first dorsal fin and the lateral line. The interval between the dorsal fins is equal to the length of the postorbital portion of the head. First dorsal spine almost invisible, second long and smooth throughout. Outer ventral ray produced into a filament longer than the fin. Pectorals long and slender.

Colours in spirit:—Silvery, with small black dots; throat and abdomen black; iris silvery.

Eight pyloric cæca. An air-bladder.

Maximum length  $6\frac{1}{2}$  inches.

Five specimens, two of which are females with gravid ovaries.

*Hab.* Andaman Sea, off Ross Island, in 265 to 271 fathoms; Bay of Bengal, between North and South Sentinel Islands, in 220 to 240 fathoms.

#### Subgenus CHALINURUS (Goode and Bean).

*Macrurus hispidus*, sp. nov.

D. 11. P. 19. V. 8.

Head compressed. Tail long and tapering. Snout slightly overhanging the upper jaw, short, truncated, with a small abrupt nasal tubercle. Eye in diameter  $3\frac{3}{4}$  in the head-length, one fourth longer than the snout, and exceeding the width of the interorbital space. Cleft of mouth lateral, extending to the vertical from the middle of the orbit. Barbel stout, as long as the eye. Teeth in four ranks in the premaxilla, those in the outer rank large, those in the inner ranks minute; mandibular teeth uniserial, large. Opercular region very long and deep; preoperculum almost square. Gill-openings wide; the gill-membranes united only at the very front. Attachment of the first branchial arch to the wall of the gill-cavity narrow. Scales thin, deciduous, of a uniform rather small size on the body. A scale from the abdomen has from fourteen to eighteen weak, semierect, yielding spines, arranged in five short, very oblique, equidistant rows. Six rows of scales between the first dorsal fin and the lateral line. The interval between the dorsal fins is equal to the length of the head behind the middle of the orbit. Second dorsal spine with numerous small semirecumbent spines.

Colours in life uniform blackish; cheeks and iris silvery.

One specimen,  $6\frac{3}{4}$  inches long, much injured.

*Hab.* Bay of Bengal, between North and South Sentinel Islands, in 220 to 240 fathoms.

## Subgenus MALACOCEPHALUS, Gthr.

*Macrurus lævis*.*Macrurus lævis*, Lowe, P. Z. S. 1843, p. 92.*Malacocephalus lævis*, Günther, Fishes, vol. iv. p. 397; \*Lütken, Vid.

Meddel. nat. Foren. Kjöbenhavn, 1872, p. 1.

*Macrurus lævis*, Günther, Zool. Chall. Exp. vol. xxii. p. 148, pl. xxxix. fig. B.

One specimen, from the Andaman Sea, off Ross Island, in 265 fathoms.

## Family Pleuronectidæ.

## SCIANECTES, Alcock.

*Scianectes*, Alcock, Journ. As. Soc. Beng. 1889, vol. lviii. pt. ii. no. 3, p. 284.*Scianectes macrophthalmus*.*Scianectes macrophthalmus*, id. ibid. p. 292, pl. xvi. fig. 4.

One specimen, from the Bay of Bengal, 40 miles south-west of Akyab, in 100 fathoms.

## APHORISTIA, Kaup.

*Aphoristia Masoni*.*Aphoristia Masoni*, id. ibid. p. 294, pl. xvii. fig. 1.

One specimen, from the Andaman Sea, 7½ miles east of North Cinque Island, in 490 fathoms.

*Aphoristia Gilesii*.*Aphoristia Gilesii*, id. ibid. p. 293, pl. xvii. fig. 2.

One specimen, from the Bay of Bengal, lat. 20° 17' N., long. 88° 51' E., in 193 fathoms.

## P H Y S O S T O M I.

## Family Sternoptychidæ.

## POLYIPNUS, Gthr.

*Polyipnus spinosus*, Gthr.*Polyipnus spinosus*, Günther, Zool. Chall. Exp. vol. xxii. pp. 170-172, pl. li. fig. B.

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\* Dr. Günther, in Zool. Chall. vol. xxii.

I have little hesitation in referring our specimen to this species (described from a single specimen obtained by the 'Challenger' between the Philippine Islands and Borneo), with which it agrees in almost every detail. In our specimen, however, the height of the body is contained once and one third in the total length, without the caudal; the eye is half the length of the head; the occipital spine is unsymmetrically bifid; each denticulation of the abdominal ridge is armed with several small vertical spines; the adipose dorsal fin is hardly visible; and the pectoral fins point backwards in the usual way.

Total length  $2\frac{1}{8}$  inches.

*Hab.* Bay of Bengal, between North and South Sentinel Islands, in 220 to 240 fathoms.

### GONOSTOMA, Rafin.

#### *Gonostoma microdon*, Gthr.

*Gonostoma microdon*, Günther, Ann. & Mag. Nat. Hist. 1878, vol. ii. p. 188.

*Cyclothone lusca*, Goode and Bean, Bull. Mus. Comp. Zool. vol. x. 1883, p. 221.

*Gonostoma microdon*, Günth. Zool. Chall. Exp. vol. xxii. p. 175.

*Hab.* Bay of Bengal, 30 miles west of Middle Andaman Island, in 485 fathoms; Andaman Sea, 7 miles south-east by south of Ross Island, in 265 fathoms.

### CHAULIODUS, Bl. Schn.

#### *Chauliodus Sloanii*, Bl. Schn.

*Chauliodus Sloanii*, Catesby, Carol. Suppl. p. 9, pl. ix.\*; Bl. Schn. p. 430\* ; Cuv. & Val. vol. xxii. p. 383.

*Chauliodus setinotus*, Bl. Schn. tab. lxxxv.\*

*Esox stomias*, Shaw, Zool. vol. v. p. 120, tab. iii.

*Chauliodus Schneideri*, Risso, Eur. Mérid. vol. iii. p. 442, fig. 37.

*Chauliodus setinotus*, Bonap. Faun. Ital., Pesc. c. fig.

*Stomias Schneideri* (*Stomias boa*), Cuv. Règne Anim. III. Poiss. pl. xvii. fig. 3.

*Chauliodus Sloanii*, Günth. Fishes, vol. v. p. 392 (to which I am indebted for the above references, marked with an asterisk, where I have not had the opportunity of referring).

*Chauliodus*, Cuv. Règne Anim., Poissons, p. 232.

*Chauliodus Sloanii*, Günth. Zool. Chall. Exp. vol. xxii. p. 179.

*Hab.* Bay of Bengal, Carpenter's Ridge, lat.  $5^{\circ} 56\frac{1}{2}'$  N., long.  $91^{\circ} 05'$  E., in 1590 fathoms; Gulf of Manaar, lat.  $6^{\circ} 29'$  N., long.  $79^{\circ} 34'$  E., in 597 fathoms.

[To be continued.]